

# Spontaneous Rupture of Spleen as a Rare Cause of Abdominal Pain: Case Report

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## ABSTRACT

*Splenic rupture is a rare cause of abdominal pain and carries a high mortality rate. While the most common cause is trauma, it may occur due to the complications of infectious, neoplastic and hematologic diseases. Patients usually suffer from acute abdominal pain in the left upper quadrant, nausea, vomiting, and dizziness. Ultrasonography is important for diagnosis and abdominal computed tomography is important especially for staging the splenic rupture. For the treatment, either splenectomy or follow-up (especially for low-grade splenic ruptures) can be done.*

**Key words:** Spontaneous rupture, Spleen, Abdominal pain

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## ÖZET

### Karın Ağrısının Nadir Bir Nedeni; Spontan Dalak Rüptürü: Olgu Sunumu

*Dalak rüptürü karın ağrısının yüksek mortalite oranına sahip nadir bir nedenidir. En sık nedeni travma olmasına rağmen infeksiyon, neoplastik ve hematolojik hastalıkların komplikasyonu olarak da meydana gelebilir. Hastalar genellikle sol üst kadranda ağrı, bulantı, kusma ve baş dönmesinden yakınırlar. Ultrasonografi tanı koymada, bilgisayarlı abdominal tomografi ise dalak rüptürünün evrelenmesi için önemlidir. Hastalara tedavide ya splenektomi yapılır ya da (düşük evreli dalak rüptürleri) takip edilir.*

**Anahtar kelimeler:** Karın ağrısı, Spontan rüptür, Dalak

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## INTRODUCTION

Splenic rupture is a life-threatening abdominal emergency and its most common cause is abdominal trauma. On the contrary, spontaneous rupture of the spleen is a rare condition. Spontaneous rupture of

the spleen may be idiopathic or occur as a complication of an infectious, neoplastic or hematologic disease. With this case report, we emphasize that spontaneous rupture of the spleen must be considered in the evaluation of abdominal pain in both traumatic and nontraumatic patients.

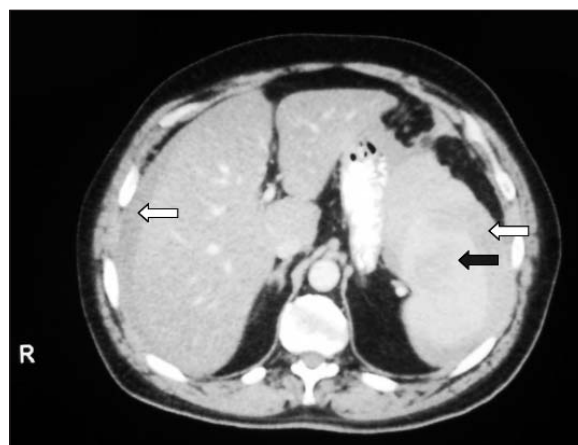
## CASE REPORT

A 48-years-old male patient presented to the emergency department with acute onset of abdominal pain. The pain had begun in the left upper quadrant suddenly while he was walking two hours before. He described the pain as severe, aggravating with breathing, radiating to the left shoulder and a sensation he had never experienced previously. There was no history of trauma. He had been taking bronchodilator treatment due to chronic obstructive pulmonary disease (COPD) and reported a smoking history of 1 pack/day for approximately 25 years.

On his physical examination, Glasgow coma score (GCS) was 15. Vital signs were measured as follows: arterial blood pressure: 155/93 mmHg, pulse: 89 beats/minute, body temperature: 36.3°C, and oxygen saturation: 97%. There was a tenderness at the left upper abdominal quadrant on palpation. Tube was closed, his abdomen was distended, and on digital examination of the rectum, the ampulla was empty. He had bilateral rhonchi.

Complete blood count revealed: white blood cells (WBC):  $12.500 \times 10^3/\mu\text{L}$ , red blood cells (RBC):  $4.79 \times 10^6/\mu\text{L}$ , hemoglobin: 13.8 g/dL, hematocrit: 41.0%, and platelets  $394 \times 10^3/\mu\text{L}$ . Routine parameters included: alanine aminotransferase (ALT): 22 U/L, aspartate aminotransferase (AST): 18 U/L, alkaline phosphatase (ALP): 87 U/L, amylase: 30 U/L, glucose: 201 mg/dL, CK: 116 U/L, CK-MB: 13.4 U/L, gamma glutamyl transpeptidase (GGT): 21 U/L, lactate dehydrogenase (LDH): 340 mmol/L, sodium: 137 mmol/L, potassium: 3.90 mmol/L, urea: 14 mg/dL, sedimentation: 10 mm/hour, and C-reactive protein (CRP): 3. ECG was normal sinus rhythm. Abdominal X-ray showed a dense gas view with no subdiaphragmatic free air or air-fluid levels.

The patient developed orthostatic hypotension during the follow-up in the emergency department. Peritoneal irritation signs were clearer on his follow-up examinations. An abdominal ultrasonography (USG) demonstrated common fluid at the perisplenic field and splenic laceration was detected. Contrast-enhanced abdominal computed tomography (CT) was planned for the patient, which was reported as Grade 3 splenic laceration with perisplenic, perihepatic and abdominal high-density liquid related to hemorrhage (Figure 1).



**Figure 1.** Contrast-enhanced abdominal computed tomography showing Grade 3 splenic laceration (black arrow) with perisplenic, perihepatic (white arrows) and abdominal high-density liquid related to hemorrhage.

Complete blood count follow-up was WBC:  $17.9 \times 10^3/\mu\text{L}$ , RBC:  $4.15 \times 10^6/\mu\text{L}$ , hemoglobin: 12 g/dL, and hematocrit: 35.0%. The patient was admitted to the general surgery intensive care unit, and splenectomy was performed with the preliminary diagnosis of splenic rupture. Neither pathological examination of the splenectomy material nor postoperative consultations with the hematology and infectious diseases departments showed any pathology to explain the rupture. After a one-week observation, the patient was discharged with a surgical cure.

## DISCUSSION

Abdominal pain is one of the most common reasons for emergency department visits, accounting for approximately 10% of all applicants<sup>[1]</sup>. Splenic rupture, which constitutes a group among causes of abdominal pain that should not be overlooked, is often seen as secondary to abdominal trauma, and requires rapid diagnosis and treatment. Spontaneous rupture of the spleen is a rare condition and constitutes up to 1% of all splenic ruptures<sup>[2]</sup>.

For spontaneous rupture of the spleen, there is often an underlying pathology such as an infectious disease (especially Epstein-Barr virus, hepatitis, salmonella, malaria), a neoplastic disease (lymphoma, leukemia), or a hematological or connective tissue disease<sup>[3]</sup>. Rokitsky first published a case of spontaneous rupture of the spleen in 1861<sup>[4]</sup>.

Patients most frequently apply to the emergency department with the complaint of upper left quadrant abdominal pain. The pain is often radiated to the left shoulder (Kehr sign). It may be accompanied with nausea, vomiting, dizziness, and syncope. Patients may have signs of shock.

When there is suspicion of splenic rupture, USG should be the first step in the imaging studies; however, CT is important for staging the splenic rupture and in deciding surgery.

Orloff and Peskin identified four-step criteria for the diagnosis of spontaneous rupture consisting of: no trauma history, no perisplenic adhesions that may support previous trauma, no disease affecting the spleen, and presence of a normal spleen micro-and macroscopically<sup>[5]</sup>. Crate and Payne added a fifth criterion in 1999 as lack of viral infections related to the spleen, especially no elevation in viral antibody titrations in the acute phase and incubation period<sup>[6]</sup>.

Our case had no trauma history. Pre and post-operative hematological and infectious causes were surveyed, and no positive findings were detected. Microscopic and macroscopic examinations of the spleen were normal. Therefore, the case was accepted as spontaneous rupture of the spleen.

Many theories have been proposed to explain spontaneous rupture of the spleen. Existence of a small area of localized disease with no traces left on the spleen is an accepted theory. Other theories are quietly chronic passive congestion causes, degenerative changes of the splenic artery or rapid dissection into the splenic parenchyma that triggers the rupture. A sudden increase in intra-abdominal pressure with exercise, coughing, vomiting, etc. can rupture the capsule of the spleen as a minor trauma<sup>[7]</sup>.

One case of spontaneous rupture of the spleen, which was published by Wehbe et al., was determined after coughing<sup>[7]</sup>. The patient applied to the emergency room with abdominal pain and low blood pressure. No hematological or infectious pathology was detected. In a case report from Lemon et al.,

spontaneous rupture of the spleen was seen after vomiting, and no other cause that could explain the splenic rupture was found<sup>[3]</sup>. Similar case reports are available in the literature.

In our case, no responsible cause for the rupture was detected. Venous congestion due to increased intraabdominal pressure after a chronic congestion or a chronic cough due to COPD was thought to be the cause of the rupture.

In conclusion, even in nontraumatic patients who admit to the emergency department with abdominal pain, splenic rupture should be kept in mind as a mortal cause. The studies needed to reveal the splenic rupture should be done immediately, and the patients should be examined for any other diseases that can trigger nontraumatic rupture of the spleen.

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